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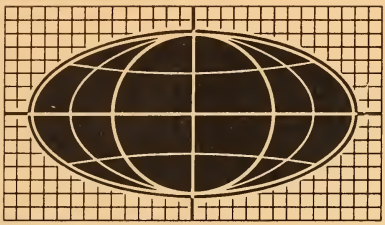

ERS Foreign 303

SUMMARY OF:

PROJECTIONS OF SUPPLY AND DEMAND FOR AGRICULTURAL PRODUCTS IN DENMARK (1970-1980)

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ABSTRACT

Demand projections from 1965 to 1980 for agricultural products in Denmark show that beef and poultry meat consumption will increase, pork consumption will remain steady, and fish will continue to be an important meat substitute. Larger imports of fruits, vegetables, and tobacco products may be anticipated.

Supply projections show that increased domestic production will account for an increase in feed grain supplies. Total feed demand, however, is projected to decline as a result of a projected decline in cattle and poultry numbers and an increase in feed efficiency. While production of bread grains will decline, output of high-protein pulses is projected to increase. Pork production is projected to increase; exportable supplies are projected to rise about 25 percent. Poultry meat and egg production is forecast to decline.

These projections are based on the assumption that Denmark will not join the European Economic Community and that the country's present agricultural policies will continue. Alternative projections, however, show that if Denmark joins the EEC after 1973, cow numbers will increase and production of milk and beef and veal will be higher.

Key Words: Denmark; Foreign agriculture; Agricultural supply and demand projections.

Washington, D.C. 20250 October 1970

PREFACE

This report summarizes the major findings of a comprehensive study, Projections of Supply and Demand for Agricultural Products in Denmark (1970-1980). The full study was conducted under contract for the Economic Research Service (ERS), U.S. Department of Agriculture, by the Economic Institute, the University of Aarhus, Denmark. Institute members contributing to the report were Palle Schelde Andersen, Peter Guldager, Arne Schmelling, John Vibe-Pedersen, and Hans E. Zeuthen. The contract was administered under the supervision of James J. Naive, Europe and Soviet Union Branch, Foreign Regional Analysis Division, ERS.

The results and views expressed are those of the researchers and do not necessarily reflect those of the U.S. Department of Agriculture. The Europe and Soviet Union Branch, Foreign Regional Analysis Division, ERS, is responsible for any errors in interpretation of the basic study.

This report summarizes one of a series of USDA-contracted studies that analyze long-term prospects for agricultural supply and demand in foreign countries. Other completed studies include those on the Netherlands, Italy, Austria, Belgium, the United Kingdom, Spain, France, West Germany, the EEC (European Economic Community), India, Turkey, Taiwan, Iran, Pakistan, UAR (Egypt), Saudi Arabia, Israel, Nigeria, Ghana, Republic of South Africa, West Indies, Australia, Colombia, Brazil, Venezuela, Chile, Peru, Central America, Argentina, South Korea, Thailand, Japan, and Mexico.

Copies of these reports are available from the Division of Information, Office of Management Services, U.S. Department of Agriculture, Washington, D.C. 20250.

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CONVERSION FACTORS AND TERMS USED

1 kr.	= 1 Danish kroner	= 13.3 U.S. cents, or 7.5 kr. per U.S. dollar.
1 ton	= 1 metric ton	= 2,204.6 lbs.
1 kg.	= 1 kilogram	= 2.20 lbs.
1 ha.	= 1 hectare	= 2.471 acres.
1 feed unit	= The feed value of 1.018 kg. of barley.	

Pork is used as a term for all meat from hogs.

Beef is used largely to describe all meat from bovine animals.

Veal is used for meat from calves less than 4 months old, mainly fed on whole milk.

SUMMARY

Supply and demand projections for agricultural products in Denmark show that consumption patterns will change as incomes and price levels change and as urban areas expand. Most projections assume that Denmark will not join the European Economic Community (EEC).

Demand projections from a 1965 base period to 1980 show that consumption of bread grains will decline. Beef consumption is projected to increase substantially, from 17.9 kilograms per capita in the base period to 24.1 kilograms in 1980. Consumption of poultry meat is projected to increase moderately, but demand for pork is expected to remain steady. Fish should continue to be an important meat substitute. Per capita consumption of fresh and processed fruits and vegetables is projected to increase, particularly consumption of citrus fruits, which is projected to rise by 30 percent. Thus, larger imports of fruits and vegetables may be anticipated. A projected increase of about 16 percent in per capita consumption of tobacco products also suggests a rising import demand.

Supply projections show that increased domestic production will account for an increase in feed grain supplies. The area sown to barley is projected to rise to 1.5 million hectares and account for nearly 80 percent of the area in grain. Barley production is expected to rise to over 6 million tons by 1980, increasing the likelihood of Denmark becoming a net exporter of grains.

Both total area and production of bread grain, on the other hand, are expected to continue to decline; production of wheat is forecast to be at least at self-sufficiency levels. Production of high-protein pulses is expected to accelerate, with the output of horsebeans increasing from 6,000 tons in the base period to 228,000 tons in 1980.

Production of pork--Denmark's most important agricultural export--is projected to increase annually by about 1.5 percent, rising to 971,000 tons in 1980. Exportable supplies of pork are projected to rise by about 25 percent to 753,000 tons. Poultry meat and egg production are expected to decline sharply. Projections of beef production, reflecting a decline in cow numbers, show that production will decline from 256,000 tons in the base period to 186,000 tons in 1980.

Total feed demand is projected to decline nearly 20 percent to 12 billion feed units. The decline reflects a projected drop in cattle and poultry numbers as well as an increase in feed efficiency. Grain used for feed is projected to decline nearly 10 percent, from 5.3 billion feed units in the base period to 4.8 billion feed units in 1980. Roughage for feed is expected to decline from about 7 to about 4.7 billion feed units. Consumption of oil cake, on the other hand, is expected to rise 10 percent to 1.4 billion feed units, and imports of soybeans and soybean products should increase. Corn imports are projected to decline as a result of the projected reduction in poultry meat production.

Alternative projections show that if Denmark joins the European Economic Community after 1973, cow numbers would increase from 1.3 million in the base period to 1.8 million in 1980. Nonmembership projections show a decrease to 936,000. EEC membership generally implies higher price levels. Therefore, the EEC membership projections on cow numbers imply that milk and beef and veal production would be higher as producers respond to a higher producer price level. Some changes in consumption patterns would also be likely because of relatively higher EEC retail prices. For example, consumption of meats--except pork--could decline and use of margarine as a substitute for butter could increase.

SUMMARY OF: PROJECTIONS OF SUPPLY AND DEMAND FOR AGRICULTURAL PRODUCTS IN DENMARK (1970-1980)

by
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INTRODUCTION

The study on which this report is based was undertaken to project longrun trends in Danish agriculture. Some analysis of expected future developments is essential to guide both public and private decisions that affect agriculture, particularly during the next decade when the market structure could change significantly.

The Danish agricultural economy is based primarily on livestock production. In 1966, production of livestock and livestock products, valued at about $1 billion, represented 90 percent of the total value of agricultural production. This percentage has not changed substantially since 1950. Hog production dominates. It contributed over 40 percent to total agricultural production in 1966 (compared with 27 percent in 1950). Dairy products are second in importance, contributing about one-fourth.

Over half of total agricultural production is exported, and agricultural exports account for over 40 percent of merchandise exports. Thus, directly or indirectly, the importance of foreign trade is a significant consideration in both agricultural production and policy decisions. Although the study does not include an analysis of foreign demand for Danish agricultural products, some general assumptions concerning future foreign demand are discussed in the supply section. Only domestic consumer consumption is discussed in the demand analysis.

Production of pork--Denmark's most important agricultural export--is assumed to increase annually by 1.5 percent, rising to 971,000 tons in 1980. Exportable supplies of pork are projected to rise by about 25 percent to 753,000 tons. Production of poultry meat and eggs is projected to trend lower. Beef production projections,

reflecting a decline in cow numbers, show that production will decline from 256,000 tons in 1966 to 186,000 tons in 1980.

Total feed demand is projected to decline nearly 15 percent to 12 billion feed units; the decrease is due largely to a projected drop in cattle and poultry numbers and rising feed efficiency. Grain used for feed is projected to decline nearly 10 percent from 5.3 billion feed units in the base period to 4.8 billion in 1980. Consumption of roughage is projected to decline to about 4.7 billion feed units; consumption in the base period was approximately 7 billion feed units. Consumption of oil cake, on the other hand, is expected to rise from 1.2 to 1.4 billion feed units, and imports of soybeans and soybean products should increase. However, corn imports are projected to decline with the reduction in poultry meat production.

A brief analysis was undertaken regarding Danish membership in the European Economic Community (EEC) after 1973. Membership generally implies higher price levels. Under this alternative, cow numbers would increase from 1.3 million in the base period to 1.8 million in 1980; nonmembership projections show a decrease to 936,000. Therefore, milk and beef and veal production would be higher as producers respond to a higher producer price level. Some changes in consumption patterns would also be likely because of relatively higher EEC retail prices. For example, consumption of meats (except pork) could decline and a higher rate of substitution of margarine for butter could result.

A major assumption in the study is that most of Denmark's present agricultural policies and marketing arrangements will continue and that Denmark will remain outside the EEC. Alternative projections were made indicating an increase in both the size of dairy herds and total beef production if Denmark joins the EEC after 1973. 1/

Unless otherwise stated, the projection year in the narrative of this summary is 1980 with 1965 as the base year. In specific instances, the base period may vary. A base period average, 1963/64-1964/65, is used for the projections of feed and feed efficiency. The base period in

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1/ Negotiations concerning possible EEC membership for Denmark, Norway, Ireland, and the United Kingdom began in 1970.

the projection of agricultural area is 1963/64. The complete study contains projections for 1970 and 1975 as well as 1980. Tables in this summary include projections for all 3 years.

GENERAL BACKGROUND 2/

The total area of Denmark (excluding the Danish-owned Faroe Islands and Greenland) is 4,306,800 hectares. In 1966, 2,994,800 hectares (7.4 million acres) were farmland. Most of the non-farmland is forest or urban areas.

Although nearly all the agricultural area can be cultivated, a large percentage is of relatively poor soil quality and requires large applications of fertilizer. Nevertheless, crop production is highly efficient and yields of the principal grains are among the world's highest.

The climate is rather cold, temperate, and coastal, and the growing season is relatively short. The climate is milder on the islands and in Eastern Jutland than in Western and Northern Jutland. Soil conditions also vary. Consequently, yields and cropping patterns vary. In Eastern Jutland, the soil is mainly clay, and the Northern and Western sections of Jutland are sandy. Smaller areas of Denmark consist of moors, marshes, and meadows.

Population and Labor

The projections of population are based on official projections made by the Danish Government (table 3). The labor force projections shown in the following tabulation are based on such variables as trends in employment rates and expected influences of social legislation.

2/ For a detailed description of Denmark's agricultural economy, see Cohen, Marshall H., The Agricultural Economy and Trade of Denmark, U.S. Dept. Agr., Econ. Res. Serv., ERS-Foreign 244, Nov. 1968.

A compound annual increase of 0.7 percent in the total population from 4.76 million in the base period to 5.31 million by 1980 was projected. The study projects the labor force at 2.51 million by 1980, an annual increase of 0.6 percent:

	Total labor force 1/
	Thousands
1960	2,190.7
1965	2,306.2
1970	2,390.3
1975	2,449.6
1980	2,513.8

1/ Data for 1960 and 1965 are midyear estimates. All data include part-time workers.

Income

Total per capita private consumption at constant 1955 prices was used as a measure of income in the analysis. 3/ Income is projected to increase at an annual rate of 2.6 percent, from 6,521 kroner in the base period to 9,578 kroner by 1980.

Gross domestic product at 1955 factor prices is projected to rise from 46.4 billion kroner ($6.1 billion) in 1966 to 78.3 billion kroner ($10.4 billion) by 1980--an approximate compounded annual growth rate of 3.7 percent (table 1).

Agricultural Area

Historically, the agricultural area in Denmark has declined very slowly, from 75 percent of total area in 1919 to 70 percent in 1965. However, an acceleration in the rate of decline occurred in 1961-66, when non-farmland expanded. The analysis assumes that agricultural area will continue to decline at an average annual rate of 12,000 hectares during the projection period. The study assumes that there will be no extreme declines in relative farm prices and incomes.

3/ Per capita private consumption was projected assuming a linear relationship between income and consumption.

Much of the transfer of agricultural land into nonfarm use has been due to the acceleration of industrialization. Since the late 1950's, both the manufacturing and the construction sectors have expanded at rapid rates. Another factor contributing to the decline in agricultural area is the expansion in forest area. The area in forest increased approximately 8 percent from 1951 to 1965 and the study assumes that expansion will continue.

Farm Numbers

The total number of farms is projected at 80,000 by 1980, a decline of nearly 50 percent from 1966. Historically, the decline has been continuous but limited by prohibitions on amalgamations and mergers, as well as restrictions on the sale of land. Since 1963, the laws have been liberalized and amalgamation has been encouraged. In 1967, the Ministry of Agriculture granted permission for mergers for up to 35-75 hectares.

The decline in farm units is expected to result from increased mergers as well as from urban growth and a decline in young farm owners. Large-size farms (30 to 60 hectares) comprised only 13 percent of all farms in 1966, but their number is projected to increase to nearly 30 percent of the total by 1980--from about 21,000 to over 25,000 farms (table 4).

Agricultural Trade

Denmark is a significant exporter of livestock products. Between 50-80 percent of Danish production in each of the major livestock products--butter, cheese, beef, and pork--is exported. In 1965, Denmark was the world's leading exporter of meat, largely because of pork exports. The country was second only to New Zealand in the export of butter. The United Kingdom is Denmark's major market for pork and butter. In 1965, Denmark accounted for about 75 percent of the United Kingdom's imports and for nearly 25 percent of its butter imports. West Germany ranks second in importance as a Danish market; Denmark supplied over 30 percent of West Germany's imported pork and over 20 percent of its imported beef and cheese in 1965. The United States is Denmark's principal purchaser of canned hams, and in 1965 took over 40 percent of its canned ham imports from Denmark.

Denmark's agricultural imports, which have been relatively small, consist of coarse grains, oilseeds and oil cakes, fruits and vegetables, and tobacco and tobacco products. Danish imports of oilseeds (largely soybeans, copra, palm kernels, and linseed) have been around 480,000 tons in recent years. Imports of oil cakes (mostly from cottonseed and soybeans, but also from ground nuts, sunflowerseed, and coconut) have been around 850,000 tons annually.

Agricultural Policy

Prior to 1958, the Danish Government's support to agriculture consisted mainly of advisory services, research and education programs, and small subsidies and grants for land reclamation and soil improvement. 4/ Nearly all prices for farm products were determined by export prices. Since 1958, Government programs have been expanded substantially in an effort to increase farm incomes.

In 1958, Government support of feed grain production was reintroduced to support farm income and avoid overproduction of pork by keeping feed costs at relatively high levels. In the past, lower feed grain prices generated surplus pork production. For feed grains (feed wheat and rye, barley, oats, corn, and sorghum), a system of both minimum prices and variable levies was introduced. 5/

From 1958 to 1964, the basic prices for each grain varied from 37 to 46 kroner per 100 kilograms; in 1965, a uniform price of 50 kroner per 100 kilograms was established for all feed grains. In 1967-68, the basic price was 52 kroner per 100 kilograms, or about $70 a ton. This relatively high price level has stimulated production of domestic feed grains--particularly barley, whose price relative to wheat and rye improved.

Also, bread grains (wheat and rye) were guaranteed from 1958 to 1965 under principles comparable to those for feed grains. However, in 1966 this system of guarantees

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4/ There had been some grain arrangements as a result of World War II.

5/ A variable levy (or duty) is a charge assessed against agricultural imports that is varied to meet differences between scheduled import prices and lower world prices.

was replaced by several regulations. Milling requirements, for example, specify the percentage of Danish grain that must be used in bread manufacturing. 6/ Also, periodic embargoes limit imports of bread grains when supplies are abundant.

The revenues from import levies are paid into a Grain Equalization Fund. In recent years, in addition to these levies, about half of the fund has been composed of Government revenues. The fund is mainly used to subsidize small dairy farmers who must purchase grain at relatively high prices from large grain farmers who are favored by a Grain Arrangement. The fund is also used to reimburse egg and poultry producers for increased feed costs and to reimburse exporters of seeds, malt, and malt barley.

A "two price" system, so-called because of the relationships between export and domestic prices, was introduced in 1962 for beef, veal, pork, poultry meat, and eggs. Under this arrangement, minimum home market or wholesale prices have been established generally above world prices. Producers receive a weighted average of both export and domestic prices. If the export price rises above the fixed home market price, the scheme is discontinued; this has occurred periodically only for beef. All price increases under the "two price" system must be approved by the Government Monopoly Board. A scheme for dairy products instituted in 1959 is structurally similar, but is administered by the private dairy organizations. The Danish dairy industry agreed on a voluntary basis to have a fixed price for dairy products sold on the home market. The arrangement for livestock products is administered by the Government.

Dairy subsidies have been administered since 1961. Annual direct cash payments were originally based on land value and cow numbers. Since 1965/66, the method of payment has largely been based on milk deliveries only, although farms with small herds receive a subsidy according to the number of cows. 7/

6/ This content has been 100 percent for several years although this percentage may drop if there is an inadequate quantity of high-quality Danish grain. Denmark has produced sufficient wheat for domestic bread consumption in recent years and exported wheat in 1968/69.

7/ The change in policy was adopted largely to accelerate efficiency in dairy production by basing support measures on productivity.

Until 1967/68, rapeseed producers were supported by a special arrangement under which margarine manufacturers were obligated to buy Danish rapeseed oil at a fixed price. The effect was to increase the price of margarine to make butter more competitive. This arrangement was discontinued in 1967/68. Instead, a direct Government subsidy of about 8 million kroner annually has been paid into a fund for rapeseed support.

Support of sugar production is based on a concessional arrangement between the Government and sugar processors. Danish food processors purchase sugar at world market prices; consequently, competition with imported sugar is avoided. Price guarantees for sugar beets apply only to a maximum area of 50,000 hectares. Farmers growing beets for sugar production in excess of domestic sugar refining requirements must bear the loss on production of surplus exportable production. This arrangement is valid until 1971.

The Implication of Recent Agricultural Policies

Although the study assumes that present agricultural policies will continue, recommendations are made for modifying certain policies. Basically, recommendations reflect a reevaluation of national agricultural priorities to utilize national resources efficiently--particularly during periods such as the late 1960's, when exports declined and agricultural costs increased.

The study suggests that the Grain Arrangement, which fixes prices for the principal grains at relatively high levels ($70 per ton), actually curbs hog production. However, the arrangement encourages the production of grains that might otherwise be imported more cheaply (such as oats) and encourages utilization of higher priced imported grains (such as corn). Indirectly, Danish production of oil cake substitutes and high protein crops, such as horsebeans, have been discouraged by the high grain supports. 8/ Furthermore, the arrangement encourages utilization of imported oil cakes that are duty free.

If Denmark becomes a net exporter of grain, export subsidies would be necessary, even if rising domestic production of grains results in lower relative prices.

8/ A support program for horsebean production will be in effect in 1970/71.

There has been strong political motivation for dairy protection since eventual EEC membership was anticipated. Danish production of dairy products could compete profitably because EEC costs are higher. If membership in the EEC is unlikely, increased investment for dairy support programs would be less advantageous. However, because of the relatively fixed factors of production in dairy production, a certain level of support is possible without encouraging sizable dairy expansion.

Supports for beef and veal production have been lower than for milk production. Consequently, beef and veal production has not expanded at a desirable rate relative to milk production. The study suggests that an increase in supports for beef production may be desirable.

Recommendations for modifying the home market regulations are proposed in the study. The present farm program has secured the farmers a level of prices and income normally sufficient to avoid foreclosure, but farmers' income levels are still relatively lower than income levels in nonfarm occupations. For many products, home market prices are much higher than export prices. In recent years, export prices have not covered many categories of production costs. If home market regulations are continued, the profits realized from home market sales will be offset by losses on the export markets. This is especially true of poultry meat and egg production. The projections assume that the home market regulations for poultry meat and eggs will be either abolished or modified so that loss-incurring exports are reduced. 9/

IMPLICATIONS FOR TRADE

The study does not include an analysis of either world demand for Danish agricultural products or implications for trade. However, some conclusions regarding trade demand may be inferred. Increased domestic consumption of such imported items as fresh and processed fruits and vegetables, tobacco, and coffee should result in increased imports of these items.

9/ In January 1970, the home market scheme for poultry meat was adjusted so that exports involving losses will be reduced and home consumption increased. As of January 1, 1970, the home market levy on poultry meat was lowered 1.20 kroner per kilogram.

Imports of fresh citrus fruit increased from about 42,000 to 55,000 tons during 1960-65, reflecting a rise in the consumption of citrus juice. Imports of both fresh and dried grapes, bananas, and a wide variety of dried fruits have been rising steadily. Pineapples, apricots, and peaches have received strong consumer interest, and import demand is expected to increase. About three-fourths of this category are imported in canned form. Imports of fruits that are also domestically grown--notably apples--may rise because per capita consumption has increased and import liberalization has occurred in recent years. A sharp rise in consumption of processed fruits--including dried fruits and nuts--has occurred; imports normally account for a significant percentage of consumption. For vegetables--tomatoes in particular--a favorable import potential is indicated because consumption is projected to rise. Since per capita rice consumption is projected to remain constant and since rice is not produced in Denmark, import demand should rise proportionally with the increase in population.

Imports of wool, which account for about 95 percent of total supply, are projected to increase. 10/ Cotton imports are projected to decline.

Demand for imported feeds is expected to decline. This projection generally reflects the projected decline in animal numbers and the increase in domestically produced feed supplies. Projections indicate that Denmark will become a net grain exporter (table 10). Net grain exports are projected to increase to nearly 2 million tons in 1980, with barley accounting for the major part. As feed requirements for poultry drop, demand for imported corn is projected to decline from 256,000 tons in the base period to 166,000 tons in 1980.

Consumption of oil cakes is projected to increase by 10 percent to about 1.4 billion feed units in 1980. Oilseeds and oil cakes and meal normally represent over 60 percent of all gross imported feeds. Nearly all oil cake and meal supplies are from imports. The rise in imports is expected to parallel the increase in use of protein in rations. Consequently, imports of soybeans should be sustained at high levels. Trends in export markets for Danish livestock products, shifts in herd composition, and price changes, for

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10/ Partly based on the assumption that Danish production (normally under 500 tons) will increase in proportion to the projected increase in sheep numbers.

example, are variables that could influence oil cake demand as well as the extent of domestic production of high protein pulses (horsebeans).

DEMAND PROJECTIONS

Methodology

The demand projections for food products are based largely on expected income and price. Other factors, such as changes in income distribution, tastes, composition of the population, and the distribution of employment, have been assumed to develop according to income or trend.

The demand analysis and projections involved the following five steps:

(1) Determination of income and price relationships from cross section and time series analyses and the selection of appropriate projection functions. 11/
(2) Projection of the population and labor force.
(3) Projection of income.
(4) Projection of prices.
(5) Projection of per capita and total consumption of the various food products.

A cross section analysis was based on a consumer survey completed in 1965 in which households were divided into 32 relatively homogeneous subgroups. Expenditures on specific food items were aggregated into 40 commodities or commodity groups. To obtain a "pure" income effect, an average income elasticity was estimated for each commodity by weighting the aggregate expenditure by each household group. 12/

The cross section analysis in many cases generally underestimated both the propensity to consume and the income elasticity compared with the time series analysis.

11/ Cross section analysis refers to relationships of data observed at one point of time, while time series analysis refers to economic data observed over successive time intervals.

12/ The concept of elasticity is used in the analyses to describe the percentage change in consumption associated with changes in either prices or incomes.

Certain age groups and certain categories of employers were not included in the time series analysis, and therefore, the population was not completely "typical."

The time series analysis was based on annual data for the period 1953-65. Per capita consumption was measured mainly by quantity; expenditure data were available for several items, but the results were generally unreliable. Several functions were tested; however, because there are only 13 observations (years) in the time series analysis, only a few explanatory variables could be used.

The statistical method employed was largely least squares regression. However, for some commodities such as poultry meat, multiple regression analysis was not possible because of the strong intercorrelation between income and prices. 13/ Per capita poultry meat consumption was alternatively projected on the assumption that a 3-percent annual growth rate would continue.

Factors used to explain changes in consumption were per capita private consumption in constant prices, deflated product prices, and prices of substitutes such as margarine for butter.

For some commodities, a trend variable was used to explain changes in tastes and preferences, changes in the composition of the population, and the effects of the distribution of the labor force.

The projection of food demand was based upon estimated income elasticity because prices were relatively insignificant. For all food products (excluding beverages and tobacco), the income elasticity was about +0.35; that is, a 10-percent increase in disposable income may generate a rise in food expenditure of 3.5 percent. Price elasticity was close to zero. Thus, the relative prices of foodstuffs as a whole have had almost no influence on actual food consumption. However, there apparently were expected substitutions between products such as meat and fish and butter and margarine. Changes in income, however, explained approximately 90 percent of the variations in food consumption.

13/ Intercorrelation in this case refers to the statistical problem encountered in estimating the extent of association between either prices or incomes and consumption, since prices and incomes strongly influenced each other.

The projections summarized below are based on the assumption that Denmark will not join the EEC. As a supplement to this summary, table 6 contains estimates based on EEC price levels of Danish per capita consumption of certain foods. Table 6 is thus a useful indication as to the possible changes a higher EEC price structure could have on Danish food consumption if Denmark joins the EEC.

The following general comments for specific foods or food categories are abstracts of a more detailed discussion found in the study. The demand projections for principal commodities appear in table 7.

Livestock and Related Products

Meats

Total consumption of meat, principally pork, has historically been high in Denmark. Consumption increased from 58.7 kilograms per capita in 1950 to 62.5 kilograms in 1965. The income elasticity for total meat is not very high at 0.47. Changes in the prices of fish explained some of the variation in the consumption of meats, indicating that fish is an important meat substitute in Denmark.

Pork, accounting for over 60 percent of meat consumption in most years, is by far the most important red meat consumed in Denmark. Per capita pork consumption is about 50 percent higher in Denmark than in the United States. No significant variation in pork consumption has occurred in Denmark since 1950, largely because pork consumption has historically been at relatively high levels. Slight declines in per capita pork consumption have occurred since 1960. Per capita pork consumption is projected to rise only slightly, from 39.2 kilograms in the 1965 base period to 40.9 kilograms by 1980 (table 7).

Beef consumption, which is relatively low in Denmark compared with consumption in countries with similar income levels, is likely to increase in the long run. Beef consumption is projected to increase at an annual rate of 2 percent, from 17.9 kilograms per capita in the base period to 24.1 kilograms by 1980 (table 7).

Consumption of poultry meat, which has increased considerably in Denmark since 1955, was only around 5 kilograms per capita in 1965. Consumption is projected to reach 7.3 kilograms per capita by 1980. This projection

is based on the assumption that consumption will increase by 3 percent annually and that poultry prices will decline during the projection period.

Fats and Oils

Total per capita consumption of the principal fats and oils--butter, margarine, shortening, and lard--has not changed significantly since 1960. Butter consumption, which declined sharply after 1958, now appears to have leveled at around 10 kilograms per capita. Both income and prices were important influences on per capita butter consumption. However, a principal cause of variations in butter consumption has been the shift in consumer habits to butter substitutes. Per capita butter consumption is projected to increase only moderately from 10.1 kilograms in the base period to 11.6 kilograms by 1980. 14/

Margarine consumption has been higher than butter consumption since 1950, averaging 13.6 kilograms per capita in the 1965 base period. Margarine consumption is expected to continue to exceed butter consumption, but is projected to decline 12 percent to 12.0 kilograms in 1980.

Cheese

Denmark has one of the highest per capita levels of cheese consumption in the world and consumption is projected to rise. Because consumption is relatively high, the price elasticities resulting from the time series analysis seemed unreliable. Price was not used in the projections. Instead, an income elasticity of 0.5 from the cross section analysis was used. From 1950 to 1965, the annual compounded rate of increase in per capita cheese consumption was about 4 percent, with consumption increasing from 5.2 to 9.4 kilograms. The annual rate of increase is projected to decline for the projection period. Per capita consumption is still projected to be 11.3 kilograms by 1980.

14/ Alternative projections using other statistical functions and using a later base period than 1965 indicate a decline in butter consumption to 7.7 kilograms per capita in 1980. This result appears to be consistent with expected developments in other high-income countries.

Grains

Total per capita consumption of grains, measured in flour equivalents, declined between 1950 and 1965 in Denmark. This trend is consistent with trends experienced by other high-income countries. Most of the variation in consumption is explained by income. Per capita consumption of rye declined from 42.2 kilograms in 1950 to 25.2 kilograms in 1965. Wheat dropped from 49.6 kilograms in 1950 to 42.7 kilograms in 1965. By 1980, per capita wheat consumption is projected to decline to 40.3 kilograms, about 6 percent below the 1965 base period. Per capita consumption of rye is projected to decline to 16.5 kilograms.

Per capita rice consumption, at 1.4 kilograms in 1965, is projected to remain constant through 1980. No significant variation in consumption occurred between 1955 and 1965.

Fruits and Vegetables

Consumption of both fresh and processed fruits in Denmark has increased rapidly from relatively low postwar levels. Because of rising incomes and relatively high consumer response, strong consumer demand is expected to continue. Industrial demand is also likely to continue to rise.

Per capita consumption of imported fresh citrus fruits (oranges and lemons) increased at an average annual rate of 5 percent between 1950 and 1965, from 5.1 to 10.8 kilograms. Consumption is projected to rise to 14.0 kilograms by 1980--an increase of nearly 30 percent.

Per capita consumption of apples rose moderately between 1955 and 1960, and leveled off at about 24 kilograms in 1965. Supplemental apple imports have increased in recent years because of liberalized import regulations that allow greater imports in years of low production. Consumption of apples is projected to increase from 24.6 kilograms in 1965 to 26.4 kilograms by 1980.

Per capita consumption of most vegetables, with the exception of potatoes and cabbage, has increased. As is the case with fruits, shifts toward more expensive vegetables are expected to continue. Also, processed products are expected to continue to be substituted for fresh products. Thus, industrial demand for fruits and vegetables for processing is expected to increase as well. Price data

were scarce and showed great seasonal variation; consequently, vegetable projections were based on income trends rather than prices.

Per capita consumption of root vegetables 15/ is projected to increase from 11.1 kilograms in the base year to 15.6 kilograms in 1980--an increase of about 2.5 percent annually. An increase in per capita consumption of tomatoes is projected--from 7.6 kilograms in the base period to 10.9 kilograms in 1980.

Both potatoes and cabbage had a negative income elasticity. Per capita consumption is projected to continue downward. In 1965, potato consumption was 95 kilograms per capita, down from 125 kilograms in 1950. Nevertheless, potato consumption in Denmark is still about twice that in the United States. By 1980, per capita potato consumption is projected to drop to 60.8 kilograms; but industrial demand for potatoes for processing is expected to continue to accelerate. Per capita cabbage consumption is projected to decline to 5.5 kilograms by 1980--about 40 percent below the base period figure.

Tobacco

Per capita consumption of total tobacco products (cigarettes, cigars, and other tobacco products) increased substantially from about 2.4 kilograms in the early 1950's to 3.2 kilograms in 1965 (consumption estimates are based on import data). For most tobacco products, consumption is a reflection of relatively strong response to income, but there is variation in the extent of this relationship between tobacco products. For example, cigarettes showed a higher income elasticity than cigars did and the income elasticity for pipe tobacco was negative.

Per capita consumption of all tobacco products is projected to increase gradually from 3.2 to 3.7 kilograms, or by about 16 percent. Because all raw tobacco is imported, this suggests a relatively favorable market potential.

Textiles

Total consumption of textiles has increased, with the composition shifting toward synthetics. In the projections,

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15/ Root vegetables include carrots, onions, horse radishes, beets, and celery roots.

prices were not considered; however, textile consumption was highly responsive to income.

Total consumption of textiles, which was about 60,000 tons in the base period, is projected to rise to over 80,000 tons by 1980. Consumption is projected to increase slightly for wool and rapidly for synthetic fibers, but is forecast to decline for cotton. Demand for synthetic fibers is projected to increase to about 46,000 tons in 1980, more than double the consumption in the base period.

The projected demand for imported cotton and wool is based on the assumption that Danish wool production (normally less than 500 tons annually) will increase in proportion to the projected increase in sheep numbers and the demand for fibers for fish nets (now made largely from synthetics). The projections further assume that demand for cotton waste will remain constant.

Import demand for wool is projected to increase slightly to 11,700 tons by 1980. Import demand for cotton, including cotton waste, is forecast to decline by about 20 percent to 22,400 tons.

SUPPLY PROJECTIONS

Crop Production 16/

Total production of grains has increased substantially since the early 1950's, largely because of considerable expansion in area. Yields for most of the major grains have also increased; yields for wheat, rye, and barley are among the highest in Western Europe. The rise in yields projected for 1970, 1975, and 1980 (table 9) was forecast by linear extrapolation of longrun 1930-65 increases. These increases resulted from improved crop varieties, increased fertilizer application, and better farming techniques. Total grain area, which accounted for approximately half the total farm area in the base period, is projected to increase from 1.57 million hectares in the base period to 1.95 million hectares in 1980 (table 8). Total production of grains is projected to rise from 5.3 to 7.6 million tons (table 10).

16/ Base period data for agricultural area and crop production are an average for 1963/64-1964/65.

Projections for grain cropping patterns show a continuing change in the composition of grain area. During the 1960's, production of bread grains (wheat and rye) and mixed grains decreased and barley output increased sharply. 17/ A further downtrend in bread grain and mixed grain area and production is projected. A projected sharp increase in the area and production of both barley and oats is expected to contribute significantly to the projected expansion in total grain area (tables 8 and 10).

The relative decline in the importance of wheat, reflecting a decrease in flour consumption, is related to the shift of production toward barley. Present agricultural policy is structured to maintain wheat production at a level sufficient for domestic milling. 18/

The projections assume there will be no net trade in wheat. Production of wheat, at 469,000 tons in the base period, is projected to decline to 356,000 tons by 1980--or to nearly 5 percent of total production.

Production of rye, a less important bread grain, is projected to decline from 275,000 to 83,000 tons, with production assumed to be equal to milling requirements during the projection period.

One of the most important developments in Danish agriculture has been the expansion of barley production. Historically, the rise is associated with the expansion of hog production. Also, intensive barley research has occurred and new barley varieties have been used.

Since 1965, a wheat/barley price ratio of 1:1 has encouraged an expansion of barley production. Even during periods when market prices of wheat were slightly higher than those of barley, the area sown to wheat declined.

A continuation of the long-range increase in both area and production of barley is projected. The increase is related to the expected rise in yields and the declining profitability of cattle raising. Barley production is

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17/ Barley and oats are the main components of mixed grains in Denmark.

18/ During surplus periods (1968/69), small quantities of wheat were diverted for feed use. At present, all domestically produced flour must be milled from domestically produced wheat.

projected to be over 6 million tons by 1980, increasing annually by about 4 percent. Area planted to barley is projected to reach 1.5 million hectares in 1980, or nearly 80 percent of total grain area, compared with 60 percent in the base period.

The decline in oat production that paralleled the decline in horse numbers during the 1950's in Denmark was a downtrend common to most of the industrial countries of Western Europe. However, this trend has reversed in Denmark in recent years and a rise in oat production has occurred. The rise has been largely due to the emphasis put on rotating oats with barley to lessen the risk of disease to barley caused by a continuous cropping. Thus, the projections assume that oat production will increase proportionally with barley production. Oat prices have generally fluctuated at about 5 percent below barley prices.

Oat production, which was 670,000 tons in the base period, is projected to rise to 995,000 in 1980. The increase in output will be mainly a result of increased acreage. Oat area, which was 198,000 hectares in the base period, is projected to increase to 273,000 hectares.

The percentage of mixed grains to total grain area and to total production has declined since the mid-1950's. The area sown to mixed grains as a percentage of total grain area is projected to decline from 12 percent in the base period to 1 percent in 1980. Contributing to past and projected downtrends are harvesting problems arising from time differences in maturity. Lower yields generally result when grains are not grown independently.

Root crop production is projected to decline sharply, reflecting declining feed demand and substitution of grass crops for root crops. Projected yields of beets for feed and potatoes equal the 1963-67 average.

Production of sugarbeets is usually in line with total consumption. Area planted to sugarbeets is limited to 50,000 hectares by Government regulations. The Government guarantees sugar prices at a level higher than world prices on an annual production of 240,000 tons. The study assumes that sugarbeet area in the projection period will remain at 50,000 hectares. Feed beets are projected to decline from about 3 million to less than 1 million tons of dry matter.

Total potato production declined sharply in the early 1960's and apparently has leveled off. A projected decline from 1,030,000 tons in the base period to 644,000 tons annually in the projection period is largely due to the continued decline in feed use of potatoes. Area in potatoes is projected to decline from 59,000 to 35,000 hectares. (The area in potatoes was 37,000 hectares in 1967.)

During the 1960's, production of grass crops increased and production of beets and beet top silage declined.

An increase in the output of aftermath--a forage grown with grain--is projected to continue. 19/ Aftermath, which has mainly been Italian ryegrass, is harvested only once. In effect, it is the second part of a multiple cropping. Grain yields have been higher when aftermath crops are included in the rotation.

Table 11 indicates the total contribution of ordinary forage crops and feed beets to the decline projected for total roughage crops. Total roughage crops are projected to decline from 9.1 million tons in the base period to around 6.0 million tons in 1980. An increase for aftermath is projected to be very strong--from 114,000 tons of dry matter in the base period to 960,000 tons in 1980.

Production of artificially dried grass may increase, particularly if nonlabor costs decline relative to labor costs. However, the possibility of an increase is related to the continued development of chemical technology and labor saving innovations in beet and silage production.

A recent development in Danish agriculture has been an increase in the production of pulses, notably horsebeans. Horsebeans are a high protein crop and could substitute for high protein concentrates such as oil cakes and meals. A difficulty in producing horsebeans is that they are harvested during the rainy autumn season and yields can be seriously affected. The study indicates that production may reach 228,000 tons in 1980, compared with only 6,000 tons in the base period.

Production of Livestock and Related Products

The production projections in table 11 are based on the assumption that Denmark will not join the EEC and that

19/ Cover crops (grass covered by grain crops) are referred to as aftermath in the study.

most present Danish agricultural policies will continue. Table 12, however, includes estimates for cow herd size and production of certain livestock products in the event of EEC membership after 1973.

Alternative developments that could affect livestock production include the degree to which industrial expansion competes with agricultural land and labor resources. If rapid industrial development and full employment reduce the number of farms and the rural labor supply, the size of cow herds could be reduced further than projected. Also, because there is a close relationship between milk and beef production, most beef is produced from dual purpose milk cows. During periods of relatively high beef prices, however, slaughter rates for milk cows may increase, and a shift in breed composition may occur.

Dairy Products

Several factors have contributed to a decline in dairy production. Export earnings have been adversely affected by both EEC tariffs and higher production of dairy products in many West European countries. Butter consumption trended lower throughout Western Europe in recent years. Of total milk production in Denmark, about 60 percent has been used for butter and 15 percent for cheese.

In recent years, the composition of dairy production has been determined by dairy associations rather than the price mechanism alone. The Federation of Dairy Associations privately implemented a "two price" support system, similar to that mentioned for other livestock products. Production is maintained at profitable levels via a subsidy system designed to prevent a rapid decline in dairy production.

Total milk production has not changed significantly since the 1950's. In the 1966 base period, it was 5.3 million tons, but is projected to decline to 4.1 million tons in 1980. The rate of decline in milk production will be retarded somewhat by increasingly higher yields. Average per cow milk yields are projected to rise by approximately 11 percent, reaching 4,395 kilograms by 1980, compared with 3,930 kilograms in the base period.

The projection of cow numbers was based on linear longrun trends. Such factors as the number of farms having cows and average herd size were considered in the projections. The analysis separates total cattle into milk cows

and cattle other than milk cows (replacement animals, fat calves, bulls, and steers). Cows are projected to decline from 1.3 million in 1966 to 936,000 in 1980. Cattle other than milk cows are projected to decline from 695,000 livestock units in 1966 to 485,000 in 1980.

Beef and Veal 20/

The production of beef and veal is closely related to the composition of the cattle herd. In 1966, about 47 percent of total beef output was derived from cows and about 28 percent from fat calves. Beef from steers and heifers and bulls is approximately 4, 13, and 8 percent, respectively.

Beef production per animal rose from around 120 kilograms in the early 1950's to 190 kilograms in 1966. This increase was due to a large reserve of calves early in the period and higher slaughter weights. Beef production per cow is projected to rise to 199 kilograms in 1980.

As mentioned earlier, beef production in Denmark is related to milk production, which is responsive to changes in price relationships and costs of production. Price relationships have also determined the age group of the cattle slaughtered. For example, slaughter of newborn calves trended sharply lower when beef prices were over 50 percent above feed costs. 21/

A considerable rise in beef prices could also result in an increase in steer production. The alternative between using bulls or steers for beef depends upon such factors as land rents, labor costs, and price relationships between bulls and steers. For example, a continued increase in labor costs should favor the less labor intensive steer production. A continuation of the price support policy for grains would increase land rents, and would thereby favor production of fat calves (slaughtered at 90-150 kg.) relative to bulls and steers (slaughtered at over 500 kg.).

20/ Production of veal is rather specialized in Denmark and has been relatively small.

21/ The alternatives of feeding fat calves, steers and heifers, and bulls for beef production are largely determined by changes in relative price levels. For example, when beef prices are higher than 4.00 kr. per kilogram, there will be a shift to bull production.

Total beef production--including exports of live animals--is forecast to decline from 256,000 tons in 1966 to 186,000 tons in 1980. Due to the projected increase in beef consumption, exportable supplies of beef are expected to decline from 156,000 tons in 1966 to 58,000 tons in 1980.

Pork

Pork production has played a vital role in Denmark's economy. In recent years, the value of pork production has been nearly equal to the combined production value of milk, beef, and veal.

Danish pork production is greatly dependent upon foreign demand. Only about one-fourth of total production is sold on the home market. The United Kingdom takes nearly all Danish bacon exports (98 percent) under an agreement; these exports account for over 45 percent of the United Kingdom's bacon consumption. The United States is Denmark's most important market for canned hams.

Annual changes in production were related to an index of gross profitability. 22/ Production was highly responsive to price changes and it increased rapidly when prices were about one-fourth above costs--at this level, investment in new buildings for hogs was profitable. When revenue was less than 120 percent of costs, a leveling of production occurred. If lower feed grain prices occur as Denmark becomes a grain exporter, the lower costs (other factors held constant) could induce higher production. This development, however, is likely to result in significantly lower pork prices.

The projections assume an annual increase of 1.5 percent in pork production from 1966 to 1980. This percentage increase assumes that shares of Danish export markets for pork will remain unchanged. Total pork production is forecast to increase by nearly one-fourth--to 971,000 tons by 1980. Exportable supplies of pork are forecast to increase from 606,000 to 753,000 tons.

22/ This index was calculated by dividing the revenue per 90 kilograms liveweight by the costs.

Poultry and Eggs

Production of both poultry and eggs has become unprofitable in recent years because of relatively low export prices. For this reason, continued production declines for both are projected.

The projections for eggs and poultry meat were based on the assumption that the current "two price" system will be discontinued or modified and that the surplus available for export will decline sharply by 1975 (table 11). Producer revenues for both poultry and eggs have been sustained largely through policies that maintain high domestic prices to offset lower export revenues. Average export prices for broilers were below production costs in 1965 and 1966; and in 1967 and 1968, average export prices were too low to cover variable costs for many producers.

The projections for eggs further assume that exports will be 10 percent of domestic consumption by 1980. Total egg production is projected to equal around 80,000 tons by 1980. Egg production increased sharply during the 1950's, reaching a peak of 160,000 tons in 1959. Production declined to 90,000 tons by 1966. 23/

Production of poultry meat, of which about 80 percent is broiler production, increased sharply until 1964, but has trended lower since then. The decline reflects the deterioration of export markets as about 70 percent of poultry meat production is exported.

The study assumes that a downward revision of poultry meat prices relative to costs is likely. It also forecasts that exports of poultry meat will be reduced from 57,000 tons in 1966 to 10,000 tons in 1980. Total production of poultry meat is projected to decline sharply to 48,600 tons in 1980, from nearly 80,000 tons in the base period.

23/ The authors revised the official estimate of 90,000 tons for 1966 downwards to 82,000 tons. On this basis, the projected production of eggs for 1980 of 80,000 tons is only a slight decline. A sharp projected increase in consumption largely offsets declines in net exports (table 12).

Feed Consumption

The study projects lower feed consumption of grains, milk and whey, and roughage (table 13). The increase in consumption of oil cakes and pulses is due to a projected rise in the average protein content of feed.

Total consumption of feeds, estimated at about 14.3 billion feed units in the base period, is projected to decline to 11.7 billion in 1980. 24/ Although total consumption of concentrates is forecast to decline in 1980, their share is projected to increase from a base period level of 47 percent to 56 percent in 1980. Consumption of roughage as a percentage of total feed consumption is projected to decline from 49 percent in the base period to 40 percent in 1980. Of lesser importance, feed use of milk and whey is projected to decline from 4.2 percent of the total in the base period to 3.9 percent in 1980.

Milk Cows

In calculating feed consumption estimates, a base weight of 550 kilograms per cow was used and it was assumed that the average annual liveweight growth would be 3 kilograms per cow. Feed efficiency was measured in terms of feed per cow and, therefore, differs from standard definitions of efficiency that relate input and output directly. A gradual increase in feed consumption per milk cow is projected due to average weight increases and higher yields of milk. This increase will largely influence the per head consumption of roughage that is projected to increase gradually.

Total consumption of feed for milk cows (table 16) is projected to decline by about 30 percent, from 5.7 billion feed units in the base period to 4.1 billion feed units in 1980. The aggregate decline largely reflects the projected decline in cow numbers. The decline is largely in total roughage consumption. In the base period, roughage was about 76 percent of total consumption and concentrates,

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24/ The base period for feed consumption is an average for 1963/64-1964/65. Feeds are commonly measured in "feed units" in Danish official statistics. Although conversions from feed units into weight equivalents vary for each feed, a "typical" feed unit is defined as the equivalent to the feed value of approximately 1 kilogram of barley.

about 24 percent. These shares are projected to change slightly in 1980, with concentrates rising to 26 percent and roughage declining to 74 percent.

Other Cattle

For cattle other than milk cows, total feeds are projected to decline by about 35 percent to approximately 2 billion feed units by 1980. Relatively strong consumption declines are projected for all feed categories, including milk and whey (an important calf feed). However, the increase in total feed efficiency for "other cattle" is projected to be slightly stronger than for milk cows. Per animal feed consumption requirements for concentrates is assumed to remain constant and thus its share in the total is projected to rise slightly (table 15).

Hogs

Unlike feed demand for other major livestock, demand for hog feed is projected to increase, reflecting an anticipated increase in the number of hogs. Total hog feed consumption is projected to rise from 4.5 billion feed units in the base period to 4.9 billion in 1980 (table 16). A sharp rise is projected for concentrates. The share of concentrates will increase proportionally with total consumption, rising from 90 percent of the total in the base period to 93 percent in 1980. The higher consumption of concentrates implies higher consumption of imported oil cakes and home-produced pulses. Projected hog consumption of milk is calculated as a residual after other feed requirements are met. Use of dairy products for hog feed is projected to continue to decline. Utilization of roughage for hog feed declined strongly in the last decade and a continued decline is projected.

Feed efficiency in hog raising--that is, declining feed inputs per 90 kilograms of pork produced--increased considerably in the past three decades. Based on feed units per 90 kilograms of pork produced, a strong feed efficiency increase is projected: base period total levels were 410 feed units utilized; projected total levels are 341 (table 15). Concentrates utilized per 90 kilograms produced were 368 in the base period and are projected to decline to 318 in 1980.

Poultry

For layers, the projections indicate a decline in feed units per kilogram of eggs produced--from 3.98 units in the base period to 3.60 in 1980. For chickens, the improvement in feed efficiency is indicated by a decline in feed unit per kilogram of poultry meat (dressed weight)--from 3.23 to 2.65 feed units. A decline of 35 percent is projected for total poultry feed consumption as flocks are expected to decrease and the rate of feed efficiency is expected to increase. 25/

Alternative Assumptions for Feed

The study makes several alternative assumptions that could modify the feed supply and demand projections. The conclusions are condensed and outlined in table 19. The assumptions include such alternatives as the surplus or deficits of feeds that would result from changes in livestock numbers; the production of certain livestock products; the protein content of oil cakes, grains, and pulses; and animal feed efficiency. Table 19 indicates the results of different assumptions for 1980 only. However, because of the relative importance of pork production in Denmark, alternative availabilities of feeds for 1970, 1975, and 1980 are shown in tables 17 and 18. The projections in these tables are based on the assumption that pork production is either higher (increasing by 2.5 percent annually) or lower (0.5 percent annually) than the assumed growth of 1.5 percent used in the actual projections.

THE EEC MEMBERSHIP ALTERNATIVE

Although the basic assumption of non-EEC membership for Denmark underlies the projections, the study does use a membership alternative for several projections. These projections include the conditions that the United Kingdom also becomes a member of the EEC, that most present policies in the EEC remain unchanged, and that no special transitional arrangements occur.

25/ Poultry feed is entirely composed of concentrates in the study. Normally, only very small amounts of roughage and refuse are fed to poultry in Denmark.

The effect on per capita consumption of certain foods at the relatively higher EEC prices is indicated in table 6. Results of EEC membership projections indicate possible changes in consumption. Except for pork and eggs, demand for many categories of livestock products shows declines. A stronger substitution of margarine for butter is also implied.

On the supply side, table 12 indicates that livestock production would increase sharply in the event of EEC membership (thus, a higher feed demand is implied). By 1980, milk cow numbers are projected to increase to 1.8 million--over 90 percent higher than the nonmembership projections. To sustain this increase, it is assumed that investment in farm buildings would increase strongly. Total milk production is also projected to rise, from 5.3 million tons in 1966 to 7.2 million tons in 1980.

Agricultural support policy in Denmark has been protecting dairy enterprises; this "national investment" has been maintained at relatively high levels in the expectation of EEC membership partly in order to maintain a competitive edge in the event of EEC membership. If membership is not forthcoming in the near future, protection will probably be administered at levels which would not encourage sizable dairy expansion.

Some of the cow herd is likely to be diverted to beef, assuming relatively higher EEC beef prices. On this basis, beef and veal production is projected to reach 417,000 tons in 1980--significantly higher than the nonmembership projection of 186,000 tons.

TABLES

Table 1.--Gross domestic product and private consumption, Denmark, 1950-66, and projections to 1970, 1975, and 1980

Year	Gross domestic product 1/	Private consumption 2/
	Million kroner	
1950	25,849	18,841
1951	25,949	18,296
1952	26,273	18,535
1953	27,833	19,073
1954	28,530	20,285
1955	28,706	20,283
1956	29,248	20,672
1957	30,830	20,793
1958	31,527	21,793
1959	33,442	23,003
1960	35,614	24,107
1961	37,592	25,976
1962	39,698	27,608
1963	39,850	27,528
1964	43,348	29,885
1965	45,392	31,029
1966	46,439	32,230
1970	54,926	36,462
1975	65,563	43,000
1980	78,326	50,895

1/ At 1955 factor prices.
2/ At 1955 market prices.

Table 2.--Per capita expenditures for food products in Denmark, at farm level and retail level, 1955, 1960, and 1965 1/

Item	Farm level			Retail level		
	1955	1960	1965	1955	1960	1965
	Kroner per capita			Kroner per capita		
Grains 2/				149.38	130.81	126.47
Wheat 2/	25.31	24.04	24.34			
Rye	15.57	11.76	10.28			
Potatoes	28.05	26.94	22.11	50.42	48.41	39.74
Sugar 3/				46.61	49.57	45.59
Sugar beets 3/	20.10	21.39	19.67			
Milk and cream				115.46	131.51	129.20
Milk 4/	79.13	90.12	88.54			
Butter	50.14	64.13	58.88	63.90	81.73	75.04
Cheese	21.78	29.70	31.35	37.82	51.57	54.44
Eggs	35.37	40.48	48.73	44.01	50.37	60.64
Pork	159.34	184.89	170.60	245.82	285.24	263.19
Beef and veal	68.97	69.37	71.78	100.45	101.03	104.54
Poultry	13.66	16.65	19.64	21.94	26.74	31.54
Total	517.42	579.48	565.92	875.82	956.98	930.39

1/ At constant 1955 prices. 2/ 100 kg. of wheat is equivalent to 75 kg. of flour and 25 kg. of bran at the retail level. For rye, 98 kg. of flour is equivalent to 100 kg. of rye. 3/ Retail expenditure is on the basis of white sugar; the farm level is based on sales of sugar beets. 4/ Whole milk used for direct consumption.

Table 3.--Total population of Denmark, by age, 1960 and 1965, 1/ projections to 1970, 1975, and 1980

Age	1960	1965	1970	1975	1980
			Thousands		
0 - 6	514.8	539.9	588.0	615.9	608.4
7 - 13	548.4	521.5	521.5	564.1	604.0
14 - 17	337.3	313.5	298.5	298.0	324.7
18 - 19	134.5	177.0	148.6	149.3	146.6
20 - 24	302.2	373.3	414.3	371.4	373.2
25 - 29	278.0	297.7	372.2	413.2	370.6
30 - 34	285.9	280.9	296.5	371.0	412.1
35 - 39	310.6	290.9	279.4	295.1	369.5
40 - 44	301.0	311.9	288.4	277.2	293.0
45 - 49	305.7	292.9	307.5	284.6	273.8
50 - 54	292.0	297.1	286.1	300.7	278.6
55 - 59	258.0	279.3	285.6	275.4	289.7
60 - 64	223.7	240.4	261.9	268.5	259.2
65 - 69	179.4	202.0	217.0	237.1	243.7
70 - 74	137.4	152.5	170.8	184.4	202.3
75 - 79	94.0	102.1	115.0	129.8	141.3
80 -	80.0	85.6	95.3	107.5	123.0
Total	4,582.9	4,758.5	4,950.2	5,143.2	5,313.7

1/ Midyear estimates.

Table 4.--Number of farms in Denmark, by size, 1951, 1956, 1961, and 1966, projections to 1970, 1975, and 1980

Farm size	1951	1956	1961	1966	1970	1975	1980
	Number						
0.55 - 9.9 hectares	98,087	93,141	91,641	61,881	43,675	25,200	11,000
10 - 14 hectares	32,554	32,426	32,771	30,819	26,600	18,500	8,300
15 - 29 hectares	49,465	48,699	48,622	48,182	47,200	43,800	37,500
30 - 59 hectares	21,401	20,721	19,693	20,870	21,800	23,400	25,300
60 - 119 hectares	3,390	3,238	2,916	3,605	4,100	5,000	6,300
120 hectares and over	938	865	877	949	1,075	1,300	1,600
Total	205,835	199,090	196,520	166,306	144,450	117,200	90,000

Table 5.--Denmark's share of important agricultural export markets, 1965 and 1966

Principal market and year	Total supply	Total imports	Imports from Denmark	Danish share of total supply	Danish share of total imports
		1,000 tons		Percent	
United Kingdom:					
Bacon and ham--					
1965	636	404	304	48	75
1966	609	403	302	50	75
Butter--					
1965	483	446	102	21	23
1966	482	452	101	21	22
Canned pork--					
1965	---	99	36	---	36
1966	---	99	38	---	39
		Mil. kroner			
West Germany:					
Beef 1/--					
1965	---	1,710	451	---	26
1966	---	1,222	260	---	21
Pork--					
1965	---	366	124	---	34
1966	---	380	131	---	34
Poultry meat--					
1965	---	1,017	48	---	5
1966	---	1,020	40	---	4
Cheese--					
1965	---	681	169	---	25
1966	---	820	186	---	23

Footnote at end of table.

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Table 5.--Denmark's share of important agricultural export markets, 1965 and 1966--Continued

Principal market and year	Total supply	Total imports	Imports from Denmark	Danish share of total supply	Danish share of total imports
	Mil. kroner			Percent	
Italy:					
Beef 1/--					
1965	---	2,628	299	---	11
1966	---	2,893	255	---	9
	1,000 tons				
United States:					
Canned ham--					
1965	214	79	33	15	41
1966	226	90	40	18	44

1/ Includes imports of live animals for slaughter.

Table 6.--Annual per capita consumption of selected food products in Denmark, at actual Danish prices, and estimates of consumption at EEC and world market prices, 1967/68

Commodity	Danish prices	EEC prices	World market prices
	Kg. per capita		
Beef and veal	20.63	16.25	18.45
Pork	39.10	49.45	42.97
Poultry 1/	5.01	4.53	6.03
Butter	10.78	7.29	15.21
Margarine	13.46	13.79	12.41
Butter and margarine	24.24	21.08	27.62
Cheese 2/	9.71	7.53	10.39
Eggs	13.62	13.68	14.28
Milk	99.74	95.70	104.00
Whipping cream	5.17	5.00	5.33
Wheat flour	42.16	41.90	42.25
Rye flour	23.45	23.32	23.59

1/ No price elasticity was used for poultry; consumption at EEC and world prices was calculated assuming an elasticity of - 0.6.

2/ No price elasticity was used for cheese; consumption at EEC and world prices was calculated assuming an elasticity of - 0.5.

Table 7.--Per capita consumption of selected agricultural products in Denmark, selected years, 1940-65, projections to 1970, 1975, and 1980

Commodity	1940	1950	1955	1960	1965	1970	1975	1980
	Kilograms							
Beef	26.4	19.3	17.1	17.1	17.9	21.3	22.6	24.1
Pork	36.3	32.4	36.8	42.6	39.2	39.4	40.1	40.9
Poultry meat 1/	5.8	4.5	3.2	3.8	4.6	5.4	6.3	7.3
Lamb and mutton	0.4	0.4	0.2	0.3	0.3	0.6	0.8	1.0
Horse meat	1.3	2.1	1.1	1.2	0.4	0.2	0.2	0.2
Total meat	70.2	58.7	58.4	65.0	62.5	66.9	70.0	73.9
Fish 2/	7.4	16.4	16.0	17.4	21.4	18.5	19.4	20.3
Butter	14.4	4.8	8.6	10.9	10.1	10.9	11.3	11.6
Margarine and shortening	9.5	14.1	19.1	19.1	18.2	18.4	18.3	18.0
Lard	3/	3/	3/	9.6	1.9	1.9	1.9	1.9
Cheese	5.1	5.2	6.5	8.8	9.4	10.0	10.6	11.3
Eggs	8.1	8.5	9.1	10.3	12.4	11.6	12.3	12.9
Whole milk	---	---	115.1	108.6	104.4	98.0	95.2	93.0
Wheat flour 4/	45.9	49.6	43.3	42.5	42.7	41.8	41.0	40.3
Rye flour 4/	49.8	42.2	36.7	28.8	25.2	21.9	19.0	16.5
Rice	1.4	0.6	1.3	1.4	1.4	1.4	1.4	1.4
Sugar	44.1	35.7	45.5	48.5	46.4	47.0	47.0	47.0
Tea	---	0.4	0.2	0.3	0.3	0.3	0.4	0.4
Coffee 5/	3.7	3.0	6.4	9.1	10.4	11.5	12.0	12.0
Cocoa 6/	---	---	0.9	1.5	1.9	2.2	2.2	2.2
Wines and spirits 7/	3.0	4.2	3.6	4.5	6.3	6.9	7.8	8.7

Footnotes at end of table.

--Continued

Table 7.--Per capita consumption of selected agricultural products in Denmark, selected years, 1940-65, projections to 1970, 1975, and 1980--Continued

Commodity	1940	1950	1955	1960	1965	1970	1975	1980
	Kilograms							
Potatoes	3/	3/	3/	3/	63.3	62.5	61.7	60.8
Citrus fruits 8/	3.2	5.1	7.6	8.7	10.8	12.3	13.1	14.0
Apples	---	---	21.6	24.1	24.6	24.1	25.2	26.4
Tomatoes	---	---	5.1	6.0	7.6	8.5	9.7	10.9
Cabbage	---	---	15.3	13.7	9.3	9.1	7.3	5.5
Root vegetables 9/	---	---	10.3	13.4	11.1	13.8	14.7	15.6
Tobacco and tobacco products 10/	0.7	3.2	2.3	2.8	3.2	3.2	3.5	3.7

1/ Since 1955, consumption and production have been based on the number of fowls slaughtered. 2/ Includes trout since 1950, excludes fish for processing of meals and oils. 3/ Data unreliable. 4/ For 1955, consumption estimates were adjusted for wheat and rye flour and resulted in an increase in the estimate for wheat flour, and a reduction in the estimate for rye flour. 5/ Raw basis beginning in 1955; data for 1940 and 1950 on a roasted basis. 6/ Bean basis. 7/ Data in litres. 8/ Oranges and lemons. 9/ Beet roots, carrots, onions, horse radish, and celery. 10/ Consumption estimates are based on trade data.

Table 8.--Distribution of the agricultural area in Denmark, by type of crop, base period 1963/64-1964/65, projections to 1970, 1975, and 1980

Crop	Base period	1970	1975	1980
	1,000 hectares			
Wheat	132	85	82	80
Rye	104	37	31	26
Barley	944	1,283	1,426	1,549
Oats	198	237	256	273
Mixed grains	191	51	37	19
Total grains	1,569	1,693	1,832	1,947
Forage crops	909	832	693	549
Feed beets	325	215	141	81
Sugar beets 1/	77	50	50	50
Potatoes	59	35	35	35
Total roughage	1,370	1,132	919	715
Seeds	82	90	90	90
Feed pulses	2	15	30	60
Horticultural products 2/	22	14	14	14
Fallow areas	3	3	2	1
Total area on farms 3/	3,048	2,947	2,887	2,827

1/ For refining.
2/ On farmland only, including spinning flax, etc.
3/ Excluding private gardens and forests.

Table 9.--Per hectare yields of selected principal crops, Denmark, 1960-67, projections to 1970, 1975, and 1980

Year	Wheat	Rye	Barley	Oats	Mixed grains	Potatoes 1/	Sugar beets 1/ 2/		Forage crops 1/
							For feed	For refining	
	100 kilograms								
1960	39.0	29.0	37.1	34.3	28.9	44.2	93.1	103.8	43.8
1961	41.2	28.1	35.1	35.0	29.9	45.3	81.3	96.9	51.4
1962	41.8	29.5	39.8	37.1	32.6	41.7	73.7	91.7	50.3
1963	36.8	27.6	36.2	36.1	31.7	46.2	85.7	95.5	49.3
1964	42.2	31.5	41.0	39.0	35.4	49.8	93.2	102.1	3/55.9
1965	44.6	30.3	39.6	38.3	34.7	52.8	70.2	80.4	56.9
1966	42.2	29.6	37.4	37.0	33.6	54.5	94.3	101.4	58.1
1967	46.6	31.5	37.5	37.2	33.7	52.8	93.6	104.3	57.1
1970	44.3	31.2	40.0	37.2	31.9	51.2	87.3	96.9	58.6
1975	46.6	33.3	41.6	38.8	33.1	51.2	87.3	96.9	61.6
1980	48.8	35.3	43.1	40.3	34.4	51.2	87.3	96.9	63.1

1/ Dry matter.
2/ Excluding tops.
3/ Slightly higher estimates for 1964-67 are due to adjustments in the method of reporting yields.

Table 10.--Production, consumption, and net export of selected commodities, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980

Commodity and year	Total production 1/	Used for feed	Industrial use	Net export and gross changes 2/
	1,000 tons			
Wheat:				
1963/64-1964/65	469	164	276	+29
1970	341	68	273	0
1975	350	70	280	0
1980	356	71	285	0
Rye:				
1963/64-1964/65	275	160	122	-7
1970	104	0	104	0
1975	94	0	94	0
1980	83	0	83	0
Barley:				
1963/64-1964/65	3,294	3,457	112	-275
1970	4,647	3,952	135	+560
1975	5,376	3,802	150	+1,425
1980	6,077	3,566	166	+2,345
Oats:				
1963/64-1964/65	670	696	41	-67
1970	796	985	28	-217
1975	899	959	23	-83
1980	995	914	20	+60

Footnotes at end of table.

--Continued

Table 10.--Production, consumption, and net export of selected commodities, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980--Continued

Commodity and year	Total production 1/	Used for feed	Industrial use	Net export and gross changes 2/
	1,000 tons			
Mixed grains:				
1963/64-1964/65	576	576	0	0
1970	145	145	0	0
1975	109	109	0	0
1980	60	60	0	0
Imported corn & grain: 3/:				
1963/64-1964/65	---	256	4/5/32	-288
1970	---	196	32	-227
1975	---	157	32	-189
1980	---	166	32	-198
Feed meal:				
1963/64-1964/65	---	289	-104	-185
1970	---	294	-99	-195
1975	---	286	-94	-192
1980	---	284	-91	-193
Total grain:				
1963/64-1964/65	5,294	5,598	479	-793
1970	6,033	5,640	473	-79
1975	6,828	5,383	485	+961
1980	7,571	5,061	495	+2,014

Footnotes at end of table.

--Continued

Table 10.--Production, consumption, and net export of selected commodities, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980--Continued

Commodity and year	Total production 1/	Used for feed	Industrial use	Net export and gross changes 2/
	1,000 tons dry matter			
Ordinary forage crops:				
1963/64-1964/65	4,740	4,716	---	6/+24
1970	4,868	4,796	---	6/+72
1975	4,268	4,196	---	6/+72
1980	3,468	3,396	---	6/+72
Aftermath: 7/				
1963/64-1964/65	114	114	---	
1970	300	300	---	
1975	600	600	---	
1980	960	960	---	
Feed beets (incl. tops):				
1963/64-1964/65	3,092	3,088	5	8/
1970	2,098	2,172	0	8/-75
1975	1,420	1,482	0	8/-62
1980	846	902	0	8/-56
Sugar beets (incl. tops):				
1963/64-1964/65	934	159	9/650	+125
1970	609	114	9/495	0
1975	615	120	9/495	0
1980	622	128	9/495	0

Footnotes at end of table.

--Continued

Table 10.--Production, consumption, and net export of selected commodities, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980--Continued

Commodity and year	Total production 1/	Used for feed	Industrial use	Net export and gross changes 2/
		1,000 tons dry matter		
Potatoes:				
1963/64-1964/65	10/227	134	11/80	12/+13
1970	10/142	52	11/80	12/+10
1975	10/142	52	11/80	12/+10
1980	10/142	52	11/80	12/+10
Factory waste: 13/				
1963/64-1964/65	---	238	-238	---
1970	---	210	-210	---
1975	---	210	-210	---
1980	---	210	-210	---
Total roughage (exclud. straw)				
1963/64-1964/65	9,107	8,449	497	+162
1970	8,017	7,644	365	+7
1975	7,045	6,660	365	+20
1980	6,038	5,648	365	+26

1/ Excludes waste and necessary quantities of seed. 2/ Excludes exports and imports of flour and groats for human consumption. 3/ Includes rice. 4/ Excludes cornstarch. 5/ 1964/65 only. 6/ Part of the export of artificially dried grass may originate from aftermath. 7/ Second crop from cereal and seed area. 8/ Fall in stock due to the fall in consumption of beets. 9/ Excludes 10 percent waste. 10/ Production on farms only. 11/ Excludes imported "raw" potatoes and private garden production. 12/ Gross exports. 13/ Waste from sugar, alcohol, and potato flour production.

Table 11.--Total production, consumption, and surplus of selected livestock products, Denmark, base period 1966, projections to 1970, 1975, and 1980

Commodity and year	Production	Consumption	Surplus 1/
		1,000 tons	
Pork:			
1966	2/788.2	182.1	606.1
1970	2/836.5	195.0	641.5
1975	2/901.2	206.2	695.0
1980	2/970.8	217.3	753.5
Beef & veal 2/:			
1966	256.1	99.9	156.2
1970	235.0	105.0	130.0
1975	212.0	116.0	96.0
1980	186.0	128.0	58.0
Eggs 3/:			
1966	82.0	51.1	24.9
1970	74.1	57.5	11.5
1975	72.7	63.1	6.3
1980	79.5	68.8	6.9
Poultry meat:			
1966	79.7	22.7	57.0
1970	66.7	26.7	40.0
1975	42.2	32.2	10.0
1980	48.6	38.6	10.0
Horsemeat:			
1966	3.0	1.2	1.8
1970	2.0	1.0	1.0
1975	1.7	1.0	0.7
1980	1.7	1.1	0.6
Mutton & lamb:			
1966	1.9	2.1	-0.2
1970	2.4	3.0	-0.6
1975	3.2	4.1	-0.9
1980	4.0	5.3	-1.3

1/ Net export (including sales to Greenland and the Faroe Islands) and stock increases. 2/ Including edible offals. 3/ Eggs for hatching 1966, 6.0 thousand tons; 1970, 5.1 thousand tons; 1975, 3.3 thousand tons; 1980, 3.8 thousand tons.

Table 12.--Number of cows and production of beef, veal, and milk, Denmark, 1966, and alternative projections to 1970, 1975, and 1980 based on nonmembership and membership in the EEC

Item	Unit	1966	1970	1975	1980
Nonmembership in EEC:					
Milk cows 1/	1,000 head	1,350	1,243	1,095	936
Production--					
Beef and veal	Kgs. meat/cow	190	189	194	199
Beef and veal	1,000 tons	256	235	212	186
Milk	Do.	5,309	5,032	4,623	4,113
Milk	Kgs. milk/cow	3,930	4,047	4,221	4,395
Butterfat	1,000 tons	223	215	198	177
Membership from 1973:					
Milk cows	1,000 head	---	---	1,350	1,800
Production--					
Beef and veal	Kgs. meat/cow	---	---	200	230
Beef and veal	1,000 tons	---	---	270	417
Milk	Do.	---	---	5,550	7,200
Butterfat	Do.	---	---	233	295

1/ The projected number of cows was based on linear extrapolation of the annual changes in the proportion of farms holding cows and the average size of herds from 1955 to 1966. Alternative projections assuming the same proportion of farms holding cows and average herd size remains at 1966 levels resulted in cow numbers projected to be 1,020 in 1980; assuming annual percentage changes in cow numbers as during 1961-66, cow numbers are projected to be 866 in 1980.

Table 13.--Consumption of feeds, by type, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980

Feeds	1963/64-1964/65	1970	1975	1980
	Million feed units 1/			
Grain and grain products	5,311	5,339	5,091	4,788
Pulses	6	53	110	228
Oil cakes	1,233	1,196	1,240	1,353
Other animal feeds	175	176	172	170
Total concentrates	6,725	6,764	6,613	6,539
Milk and whey	596	559	510	455
Roughage crops 2/	6,954	6,303	5,506	4,681
Total consumption of feeds (excluding straw)	14,275	13,626	12,629	11,675

1/ 1 feed unit is approximately the equivalent of 1 kilogram of barley.
2/ Grasses, aftermath (second crop from grain areas), various root crops, and factory refuse.

Table 14.--Use of dairy products for feed, Denmark, base period 1966, projections to 1970, 1975, and 1980

Commodity	1966	1970	1975	1980
	Million feed units			
Whole milk 1/	67	63	58	51
Other	522	496	452	404
Skim milk	375			
Skim milk powder	44			
Buttermilk	34			
Whey	69			
Total	589	559	510	455

1/ Excluding waste.

Table 15.--Projected development in feed efficiency, by animal category, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980

Animal and year	Concentrates	Milk & whey	Roughage	Total
	Feed units per head			
Cattle:				
Cows--				
1963/64-1964/65	1,010	2	3,178	4,190
1970	1,060	2	3,227	4,289
1975	1,115	1	3,240	4,356
1980	1,165	1	3,249	4,415
Other--				
1963/64-1964/65	721	410	3,290	4,421
1970	721	400	3,203	4,324
1975	721	400	3,100	4,221
1980	721	400	2,997	4,118
	Feed units per 90 kg. of pork produced			
Hogs:				
1963/64-1964/65	368	28	14	410
1970	353	24	10	387
1975	336	21	7	364
1980	318	18	5	341
Poultry 1/:				
	Feed units per kg. of eggs			
Layers--				
1963/64-1964/65	3.98			3.98
1970	3.85			3.85
1975	3.70			3.70
1980	3.60			3.60
	Feed units per kg.			
Chickens 2/--				
1963/64-1964/65	3.23			3.23
1970	3.00			3.00
1975	2.80			2.80
1980	2.65			2.65

1/ All feed assumed to be concentrates.
2/ For slaughter, dressed weight.

Table 16.--Consumption of feeds, by animal category, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980

Item	Number of animals or quantity produced	Consumption of feed			
		Concentrates	Milk & whey	Roughage	Total
	1,000 head	Million feed units			
Cattle:					
Cows--					
1963/64-1964/65	1,375	1,387	4	4,366	5,757
1970	1,243	1,318	2	4,013	5,333
1975	1,095	1,221	1	3,549	4,771
1980	936	1,090	1	3,041	4,132
	1,000 livestock units				
Other--					
1963/64-1964/65	695	502	285	2,289	3,076
1970	644	464	258	2,064	2,786
1975	568	409	227	1,760	2,396
1980	485	350	194	1,453	1,997
	1,000 tons liveweight produced				
Hogs:					
1963/64-1964/65	993	4,060	307	155	4,522
1970	1,121	4,398	299	125	4,822
1975	1,208	4,510	282	94	4,886
1980	1,301	4,599	260	72	4,931

Footnotes at end of table.

--Continued

Table 16.--Consumption of feeds, by animal category, Denmark, base period 1963/64-1964/65, projections to 1970, 1975, and 1980--Continued

Item	Number of animals or quantity produced	Consumption of feed			
		Concentrates	Milk & whey	Roughage	Total
	Mil. kg. eggs	Million feed units			
Poultry:					
Layers--					
1963/64-1964/65	90.8	362	---	---	362
1970	74.1	285	---	---	285
1975	72.1	269	---	---	269
1980	79.5	286	---	---	286
Other--					
1963/64-1964/65	2/	368	---	---	368
1970	2/	273	---	---	273
1975	2/	179	---	---	179
1980	2/	188	---	---	188
Total consumption: 3/					
1963/64-1964/65		6,725	596	6,954	14,275
1970		6,764	559	6,303	13,626
1975		6,613	510	5,506	12,629
1980		6,539	455	4,681	11,675

1/ Including chickens for breeding. 2/ No data were available for the feed efficiency for turkeys, ducks, and geese. 3/ Totals include horses and sheep.

Table 17.--Changes in the net surplus of feeds in Denmark, assuming pork production increases 2.5 percent annually 1/

Item	1970	1975	1980
	- - 1,000 tons (liveweight) - -		
Change in the production of pork	+44.9	+111.6	+191.7
	- - - Million feed units - - -		
Change in the net feed surplus:			
Oil cakes	2/-36	-100	-187
Barley	-118	-263	-401
Oats	-26	-57	-89
Animal feeds and bran	-11	-27	-44
Total	-191	-447	-721

1/ The rate of growth assumed in the actual projections is 1.5 percent annually.

2/ A minus (-) indicates a deficit supply.

Table 18.--Changes in the net surplus of feeds in Denmark, assuming pork production decreases 0.5 percent annually 1/

Item	1970	1975	1980
	- - 1,000 tons (liveweight) - -		
Change in the production of pork.....	2/-43.5	-102.9	-168.4
	- - - Million feed units - - -		
Change in the net feed surplus:			
Oil cakes.....	+35	+93	+164
Barley.....	+112	+241	+353
Oats.....	+25	+53	+78
Animal feeds and bran.....	+12	+25	+38
Total.....	+184	+412	+633

1/ Actual projections assume a rate of growth of 1.5 percent annually.

2/ A minus (-) indicates a deficit supply.

Table 19.--Projected changes in agricultural area and net surplus of various feeds in Denmark, 1980, under alternative assumptions

Commodity	Assumptions 1/									
	1	2	3	4	5	6	7	8	9	10
	1,000 hectares									
Changes in area:										
Wheat and rye	2/-14	---	---	---	---	---	---	---	---	---
Barley, oats, and mixed grains	+14	+36	---	-100	+19	---	-7	+84	+79	---
Feed beets	---		---			---	-12	-11	-11	---
Grass	---	-36	---	---	-19	---	+19	-73	-68	---
Pulses	---	---	---	+100	---	---	---	---	---	---
Total	0	0	---	0	0	---	0	0	0	---
	Million feed units									
Changes in net surplus:										
Oil cakes	+13	---	+153	+186	---	+18	+32	+10	-177	+315
Barley	+768	+117	-125	-167	+62	+67	-49	+364	+402	-1,024
Oats	+106	+17	-28	-11	+9	+15	-9	+59	+69	-228
Animal feeds	---	---	---	---	---	---	---	+3	---	-26
Bran, etc	---	---	---	---	---	---	---	+4	---	-35
Total	+887	+134	0	+8	+71	+100	-26	+440	+294	-998

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1/ Alternative assumptions are:

1--The increase in grain and pulse yields will be double the projected increase.

2--Grass yields between 1970 and 1980 will increase by 75 feed units annually rather than declining as projected.

3--The average protein content of oil cakes will increase by 10 percent, from 308 to 339 grams per feed unit.

4--The area in feed pulses will increase 100,000 hectares more than projected.

5--Production of grass as a second crop (aftermath) will increase and production of ordinary grass crops will decrease. This alternative assumes that the additional grain area will increase proportionately for barley, oats, and mixed grains.

6--Grass production will replace concentrates and artificially dried grass will be used in greater quantities.

7--100 million feed units of grass will be substituted for 100 million feed units of beets.

8--The number of cows will be 100,000 fewer than projected.

9--Consumption of roughage by cattle will be 10 percent lower than projected.

10--The feed efficiency in the projection period will remain the same as in the base period for hogs.

2/ A minus (-) indicates a decrease in the area of feed units.

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